

CLAIMS

1. A voice recognition system comprising:
 - 2 an adaptation model containing acoustic pattern information; and
 - an adaptation engine for performing pattern matching of acoustic feature
- 4 vectors with the acoustic pattern information to identify a selected feature vector modification function.
2. The voice recognition system of claim 1 wherein the adaptation engine is
- 2 further configured to apply the selected feature vector modification function to
- the acoustic feature vectors to produce a set of modified acoustic feature
- 4 vectors.
3. The voice recognition system of claim 1 further comprising a voice
- 2 recognition engine for matching the set of modified acoustic feature vectors with
- an acoustic model.
4. The voice recognition system of claim 1 further comprising a control
- 2 processor for evaluating the performance of the selected feature vector
- modification function and adjusting the selected feature vector modification
- 4 function based on the evaluating.
5. The voice recognition system of claim 1 further comprising a memory for
- 2 storing at least one set of parameters corresponding to a set of feature vector
- modification functions, wherein the selected feature vector modification function
- 4 is a member of the set of feature modification functions.
6. The voice recognition system of claim 5 wherein the memory contains
- 2 more than one set of parameters corresponding to a set of feature vector
- modification functions, and wherein each set of parameters corresponds to a
- 4 specific speaker.
7. The voice recognition system of claim 5 wherein the memory contains
- 2 more than one set of parameters corresponding to a set of feature vector

modification functions, and wherein each set of parameters corresponds to a
4 different acoustic environment.

8. A voice recognition system comprising:
2 an adaptation model containing acoustic pattern information; and
an adaptation engine for performing pattern matching of acoustic feature
4 vectors with the acoustic pattern information to identify a speaker-dependent
feature vector modification function and apply the speaker-dependent feature
6 vector modification function to the acoustic feature vectors.

9. A voice recognition system comprising:
2 an adaptation engine for analyzing acoustic feature vectors to identify a
selected feature vector modification function and applying the selected feature
4 vector modification function to the acoustic feature vectors to produce a set of
modified acoustic feature vectors;
6 an acoustic model; and
a voice recognition engine for matching the set of modified acoustic
8 feature vectors with the acoustic model.

10. The voice recognition system of claim 9 further comprising an adaptation
2 model, wherein said adaptation engine performs the analyzing acoustic feature
vectors by matching the acoustic feature vectors with acoustic patterns stored in
4 the adaptation model.

11. The voice recognition system of claim 9 further comprising a control
2 processor for evaluating the performance of the selected feature vector
modification function and adjusting the selected feature vector modification
4 function based on the evaluating.

12. The voice recognition system of claim 9 further comprising a memory for
2 storing at least one set of parameters corresponding to a set of feature vector
modification functions, wherein the selected feature vector modification function
4 is a member of the set of feature modification functions.

13. The voice recognition system of claim 12 wherein the memory contains
2 more than one set of parameters corresponding to a set of feature vector
modification functions, and wherein each set of parameters corresponds to a
4 specific speaker.

14. The voice recognition system of claim 12 wherein the memory contains
2 more than one set of parameters corresponding to a set of feature vector
modification functions, and wherein each set of parameters corresponds to a
4 different acoustic environment.

15. A remote station apparatus comprising:
2 an adaptation model containing acoustic pattern information; and
an adaptation engine for performing pattern matching of acoustic feature
4 vectors against the acoustic pattern information to identify a selected feature
vector modification function, and applying the selected feature vector
6 modification function to the acoustic feature vectors to produce a set of modified
acoustic feature vectors.

16. The remote station apparatus of claim 15 further comprising a control
2 processor for evaluating the performance of the selected feature vector
modification function and adjusting the selected feature vector modification
4 function based on the evaluating.

17. The remote station apparatus of claim 15 further comprising a memory
2 for storing at least one set of parameters corresponding to a set of feature
vector modification functions, wherein the selected feature vector modification
4 function is a member of the set of feature modification functions.

18. The remote station apparatus of claim 17 wherein the memory contains
2 more than one set of parameters corresponding to a set of feature vector
modification functions, and wherein each set of parameters corresponds to a
4 specific speaker.

19. The remote station apparatus of claim 17 wherein the memory contains
2 more than one set of parameters corresponding to a set of feature vector
modification functions, and wherein each set of parameters corresponds to a
4 different acoustic environment.

20. The remote station apparatus of claim 15 further comprising a
2 communications interface for communicating the modified acoustic feature
vectors to a communications center.

21. A voice recognition communication center apparatus comprising:
2 a communications interface for receiving acoustic feature vectors,
wherein the acoustic feature vectors have been modified using a feature vector
4 modification function;
an acoustic model containing acoustic patterns, wherein the acoustic
6 model is not trained to a single speaker;
a voice recognition engine for matching the set of modified acoustic
8 feature vectors with the acoustic model; and
a control processor for evaluating the feature modification function based
10 on the matching.

22. A voice recognition communication center apparatus comprising:
2 a communications interface for receiving acoustic feature vectors and
speaker identification information from at least one remote station;
4 a memory containing speaker-dependent feature vector modification
function parameters; and
6 an adaptation engine for performing pattern matching of the acoustic
feature vectors with an acoustic model, identifying a selected speaker-
8 dependent feature vector modification function based on the pattern matching
and the speaker identification information, and applying the selected speaker-
10 dependent feature vector modification function to the acoustic feature vectors to
produce a set of modified acoustic feature vectors.

23. The voice recognition communication center apparatus of claim 22 wherein the adaptation engine further comprises a voice recognition engine for matching the set of modified acoustic feature vectors with a central acoustic model, wherein the central acoustic model is not trained to a single speaker.

24. The voice recognition communication center apparatus of claim 22 further comprising a central acoustic model, wherein the central acoustic model is not trained to a single speaker, and wherein the adaptation engine is further configured to perform pattern matching of the set of modified acoustic feature vectors with the central acoustic model.

25. The voice recognition communication center apparatus of claim 22 further comprising a voice recognition engine for matching the set of modified acoustic feature vectors with a central acoustic model.

26. The voice recognition communication center apparatus of claim 22 further comprising a control processor for evaluating the performance of the selected speaker-dependent feature vector modification function and adjusting the parameters of the selected feature speaker-dependent vector modification function in the memory based on the evaluating.

27. A method of performing voice recognition comprising:
extracting acoustic feature vectors;
performing adaptation pattern matching of the acoustic feature vectors with an adaptation model;
selecting a feature vector modification function based on the adaptation pattern matching;
applying the selected feature vector modification function to the acoustic feature vectors to form a set of modified acoustic feature vectors; and
performing voice recognition pattern matching of the set of modified acoustic feature vectors with an acoustic model.

28. The method of claim 27 wherein the feature vector modification function
2 is selected from a speaker-dependent set of feature vector modification
functions.

29. The method of claim 28 further comprising modifying the speaker-
2 dependent set of feature vector modification functions based on the adaptation
pattern matching.

30. The method of claim 28 further comprising modifying the speaker-
2 dependent set of feature vector modification functions based on the voice
recognition pattern matching.

31. The method of claim 27 wherein the feature vector modification function
2 is specific to an acoustic environment.

32. A method of performing voice recognition comprising:
2 at a remote station, performing adaptation pattern matching of acoustic
feature vectors with an adaptation model stored in the remote station;
4 at the remote station, selecting a feature vector modification function
from feature vector modification function information stored at the remote
6 station, wherein the selecting a feature vector modification function is based on
the pattern matching;
8 at the remote station, applying the selected feature vector modification
function to the acoustic feature vectors to form a set of modified acoustic feature
10 vectors; and
12 sending the modified acoustic feature vectors from the remote station to
a communications center.

33. The method of claim 32 wherein the feature vector modification function
2 information is speaker-dependent.

34. The method of claim 32 further comprising modifying the feature vector
2 modification function information based on the adaptation pattern matching.

35. The method of claim 32 further comprising modifying the feature vector
2 modification function information at the remote station based on information
received from the communications center.

36. The method of claim 32 further comprising performing voice recognition
2 at the remote station, wherein the performing voice recognition comprises
performing voice recognition pattern matching of the modified acoustic feature
4 vectors with an acoustic model stored in the remote station.

37. The method of claim 36 further comprising modifying the feature vector
2 modification function information at the remote station based on the voice
recognition pattern matching.

38. The method of claim 32 wherein the feature vector modification function
2 information is environment-dependent.

39. A method of performing voice recognition in a system comprising at least
2 one remote station and a communications center, the method comprising:
at the remote station, extracting acoustic feature vectors;
4 sending the acoustic feature vectors from the remote station to the
communications center;
6 at the communications center, performing adaptation pattern matching of
the acoustic feature vectors with an adaptation model stored in the
8 communications center;
at the communications center, selecting a feature vector modification
10 function from a database stored in the communications center, wherein the
selecting a feature vector modification function is based on the adaptation
12 pattern matching;
at the communications center, applying the selected feature vector
14 modification function to the acoustic feature vectors to form a set of modified
acoustic feature vectors; and

16 at the communications center, performing voice recognition pattern
matching of the set of modified acoustic feature vectors with an acoustic model
18 stored in the communications center.

40. The method of claim 39 further comprising, at the communications
2 center, selecting a speaker-dependent set of feature vector modification
functions, wherein the selected feature vector modification function is selected
4 from the speaker-dependent set of feature vector modification functions.

41. The method of claim 40 further comprising modifying the speaker-
2 dependent set of feature vector modification functions based on the adaptation
pattern matching.

42. The method of claim 40 further comprising modifying the speaker-
2 dependent set of feature vector modification functions based on the voice
recognition pattern matching.

43. The method of claim 40 further comprising sending, from the remote
2 station to the communications center, speaker identification information,
wherein the selecting a speaker-dependent set of feature vector modification
4 functions is based on the speaker identification information.

44. A method of performing voice recognition in a system comprising at least
2 one remote station and a communications center, the method comprising:
at the remote station, extracting unmodified acoustic feature vectors;
4 at the remote station, performing adaptation pattern matching of the
unmodified acoustic feature vectors with an adaptation model stored in the
6 remote station;
at the remote station, selecting a speaker-dependent feature vector
8 modification function based on the adaptation pattern matching;
at the remote station, applying the selected speaker-dependent feature
10 vector modification function to the acoustic feature vectors to form a set of
modified acoustic feature vectors;

- 12 sending the modified acoustic feature vectors from the remote station to
the communications center;
- 14 at the communications center, performing voice recognition pattern
matching of the set of modified acoustic feature vectors with an acoustic model
16 stored in the communications center.

45. The method of claim 44 further comprising modifying the selected
2 speaker-dependent feature vector modification function based on the adaptation
pattern matching.

46. The method of claim 44 further comprising:
- 2 sending the unmodified acoustic feature vectors from the remote station
to the communications center;
- 4 at the communications center, analyzing the selected speaker-dependent
feature vector modification function using the modified acoustic feature vectors
6 and the unmodified acoustic feature vectors; and
- at the remote station, modifying the selected speaker-dependent feature
8 vector modification function based on the analyzing.

47. The method of claim 44 further comprising modifying the speaker-
2 dependent set of feature vector modification functions based on the voice
recognition pattern matching.

48. A voice recognition system comprising:
- 2 means for extracting acoustic feature vectors;
- means for performing adaptation pattern matching of the acoustic feature
4 vectors with an adaptation model;
- means for selecting a feature vector modification function based on the
6 adaptation pattern matching;
- means for applying the selected feature vector modification function to
8 the acoustic feature vectors to form a set of modified acoustic feature vectors;
and

10 means for performing voice recognition pattern matching of the set of modified acoustic feature vectors with an acoustic model.

49. A remote station apparatus comprising:

2 means for performing adaptation pattern matching of acoustic feature vectors with an adaptation model stored in the remote station;

4 means for selecting a feature vector modification function from feature vector modification function information stored at the remote station, wherein
6 the selecting a feature vector modification function is based on the pattern matching;

8 means for applying the selected feature vector modification function to the acoustic feature vectors to form a set of modified acoustic feature vectors;

10 and

12 means for sending the modified acoustic feature vectors to a communications center.